SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-01**

PROJECT: **Sunoco Philadelphia Refinery**
SITE LOCATION: **AOI-8**
JOB NO.: -
LOGGED BY: **Shaun Sykes**
DATES DRILLED: **6/17/08**

DRILLING CO.: **Parrat Wolff Inc.**
DRILLING METHOD **Direct Push**
SAMPLING METHOD **Split Spoon**
TOTAL DEPTH: **2'**

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - dry gravel and fine sand		
		0.0	Same		
		0.1	Dry brown sandy silt and gravel		
	Sample taken from 1-2' for laboratory analysis	0.2	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-02**

PROJECT: **Sunoco Philadelphia Refinery**
SITE LOCATION: **AOI-8**
JOB NO.: -
LOGGED BY: **Shaun Sykes**
DATES DRILLED: **5/7/08**

DRILLING CO.: **Parrat Wolff Inc.**
DRILLING METHOD **Direct Push**
SAMPLING METHOD **Split Spoon**
TOTAL DEPTH: **2'**

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, tan silt		
		0.0	Same		
		0.0	Fill, stiff brown/gray sandy silt, gravel		
	Sample taken from 1-2' for laboratory analysis	0.0	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-03**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		5.6	Fill - stiff med. brown andy silt, gravel, brick		
		83	Fill - black/brown silty sand and gravel, dry		
		265	Same		
	Sample taken from 1-2' for laboratory analysis	142	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-04**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/8/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - brown sandy silt and gravel, dry		
		7.9	Same, stiff		
		122	Fill - black sandy silt and gravel		
	Sample taken from 1-2' for laboratory analysis	179	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-05**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**8'**
DATES DRILLED:	**5/8/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, some tan sandy silt, dry		
		0.0	Same		
		1,7	Fill - black/brown sandy silt, brick		
		5.5	Same		
		13.8	Same		
		25.4	Same		
		16.7	Same		
		7.9	Same		
		12.3	Fill - gravel		
		14.7	Fill - black sand and gravel		
-5		16.9	Same		
		8.4	Same		Water at 4.5-5'
		4.4	Fill - brown/black gravel, wet, some metallic objects		
		7.8	Same		
	Sample taken 6-8' for laboratory analysis	59.3	Same		
		26.7	Same, increased sand content		Boring complete @ 8'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-06**

PROJECT: **Sunoco Philadelphia Refinery**
SITE LOCATION: **AOI-8**
JOB NO.: -
LOGGED BY: **Shaun Sykes**
DATES DRILLED: **5/8/2008**

DRILLING CO.: **Parrat Wolff Inc.**
DRILLING METHOD **Direct Push**
SAMPLING METHOD **Split Spoon**
TOTAL DEPTH: **8'**

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - tan brown sandy silt, gravel, dry		
		0.0	Same		
		0.0	Same		
		0.0	Gravel		
		48.8	Black/brown sandy silt and gravel		
		14.4	Same		
		20.7	Same		
			Same		
	No sample taken (no tank bottom material observed)	43.7	Same		
		56.8	Same		
-5		103	Fill - brick, black sandy silt		
		76.5	Same		Water at 5.5-6'
		56.4	Same		
		65.5	Fill - black sandy clay, brick		
		43.4	Same		
		36.5	Same		Boring complete @ 8'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-07**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/8/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill, gravel, tan sandy silt, dry		
		35.6	Fill, stiff, brown sandy silt and gravel		
		163	Fill, black sandy silt and gravel		
	Sample taken from 1-2' for laboratory analysis	287	Fill, black sandy clay and gravel		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-08**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, tan sandy silt, dry		
		0.0	Same		
		0.0	Fill - black/brown sandy silt & gravel		
	Sample taken from 1-2' for laboratory analysis	0.0	Same, brick		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-09**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, tan sandy silt, dry		
		2.8	Fill - black/brown sandy silt & gravel		
		7.9	Same		
	Sample taken from 1-2' for laboratory analysis	8.0	Same, wood		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-10**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill, dark brown silt, gravel, dry		
		0.0	Same, brick		
		0.0	Same		
	Sample taken from 1-2' for laboratory analysis	0.0	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-11**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, cement		
		0.0	Same		
		6.4	Fill - black/brown sandy silt, fill, gravel		
	Sample taken from 1-2' for laboratory analysis	19.1	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-12**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/6/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - brown sandy silt, gravel		
		13.3	Same		
		55.8	Fill - compact brown/black silty clay, gravel		
	Sample taken from 1-2' for laboratory analysis	95.6	Fill - black silty clay, gravel		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-13**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/6/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, light brown silt, dry		
		0.0	Same		
		17.2	Fill - brown/black silty clay, gravel		
	Sample taken from 1-2' for laboratory analysis	20.7	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-14**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/6/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - very stiff orange brown sandy clay, rock frags, dry		
		10.4	Black layer, clay		
		0.0	Fill - dark brown/black clay with sand and gravel, cinders		
	Sample taken from 1-2' for laboratory analysis	0.0	Fill - brick, dry		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-15**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/6/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, brown sandy silt, dry		
		0.0	Same		
		0.0	Same		
	Sample taken from 1-2' for laboratory analysis	0.0	Fill - brown silty clay		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-16**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, brown sandy silt, dry		
		193	Same		
		215	Black silty clay, gravel, stiff		
	Sample taken from 1-2' for laboratory analysis	286	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-17**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - brown sandy silt, dry		
		0.0	Same, gravel		
		0.0	Fill - brown/black sandy silt, gravel		
	Sample taken from 1-2' for laboratory analysis	0.9	Same, some clay		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-18**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - brown sandy silt, gravel, dry		
		0.0	Same		
		0.0	Same		
	Sample taken from 1-2' for laboratory analysis	0.0	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-19**

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PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**8'**
DATES DRILLED:	**6/19/2008**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0			Fill, concrete, gravel		
		105	Black sand, wood, brick, moist		
		216	Same		
		173	Black sand and gravel, very moist		
	No sample taken (no tank bottom material observed)	356	Same		
-5		211	Same		
		256	Coarse sand and gravel, black, wet		Water at 6-6.5'
		108	Same		
					Boring complete @ 8'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-21**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - brown/orange sandy silt, gravel, dry		
		3.6	Same		
		10.4	Same, dark brown/black		
	Sample taken from 1-2' for laboratory analysis	0.1	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-22**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - tan sitly sand, gravel, dry		
		3.5	Fill - stiff brown/black sandy silt, gravel, brick dry		
		40.0	Same		
	Sample taken from 1-2' for laboratory analysis	115	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-23**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill, tan sandy silt, gravel, dry		
		75.6	Fill - stiff brown/black sandy silt, gravel, dry		
		89.8	Same		
	Sample taken from 1-2' for laboratory analysis	38.6	Same, dark brown		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-24**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/7/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		3.6	Fill, brown sandy silt, gravel, dry		
		282	Same		
		598	Fill, black/brown silty sand, gravel, dry		
	Sample taken from 1-2' for laboratory analysis	968	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-25**

PROJECT: **Sunoco Philadelphia Refinery**
SITE LOCATION: **AOI-8**
JOB NO.: -
LOGGED BY: **Shaun Sykes**
DATES DRILLED: **5/7/08**

DRILLING CO.: **Parrat Wolff Inc.**
DRILLING METHOD **Direct Push**
SAMPLING METHOD **Split Spoon**
TOTAL DEPTH: **2'**

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		72.4	Fill - brown/black sandy silt, gravel, brick, dry		
		103	Same		
		276	Same		
	Sample taken from 1-2' for laboratory analysis	137	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-26**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/8/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill, tan/brown sandy silt and gravel, dry		
		0.0	Same		
		1.2	Fill, brown/black silty sand and gravel, some clay		
	Sample taken from 1-2' for laboratory analysis	2.1	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-27**

PROJECT: **Sunoco Philadelphia Refinery**
SITE LOCATION: **AOI-8**
JOB NO.: -
LOGGED BY: **Shaun Sykes**
DATES DRILLED: **5/6/08**

DRILLING CO.: **Parrat Wolff Inc.**
DRILLING METHOD **Direct Push**
SAMPLING METHOD **Split Spoon**
TOTAL DEPTH: **2'**

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, brown silt, dry		
		0.0	Fill - gravel, brown sandy silt, brick, compact		
		0.0	Same		
	Sample taken from 1-2' for laboratory analysis	0.0	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-28**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/6/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, brown sandy silt, dry		
		13.3	Fill, brown/black sandy silt, gravel		
		55.8	Same		
	Sample taken from 1-2' for laboratory analysis	95.6	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-29**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/6/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		15.1	Fill - gravel, dry		
		10.0	Fill - gravel, black		
		43.1	Fill - brick, sandy clay, brown/black		
	Sample taken from 1-2' for laboratory analysis	56.3	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-31**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/6/08**		

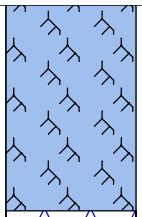
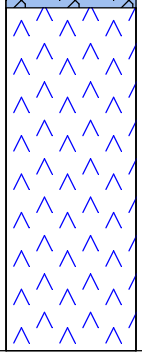
DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Grass, fill - dark brown silt, gravel, brick, dry		
		0.0	Fill - silt, gravel, brick, dry		
		0.0	Same		
	Sample taken from 1-2' for laboratory analysis	0.0	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-32**

PROJECT: **Sunoco Philadelphia Refinery**
SITE LOCATION: **AOI-8**
JOB NO.: -
LOGGED BY: **Tiffani Doerr**
DATES DRILLED: **7/3/08**

DRILLING CO.: **NA**
DRILLING METHOD **Hand Auger**
SAMPLING METHOD **Hand Auger**
TOTAL DEPTH: **2'**

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Grass and topsoil top 8"		
		0.0	Dry, medium brown sandy clay with few gravels		
		0.0			
	Sample taken from 1-2' for laboratory analysis	0.0			Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-33**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/6/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, brick, sandy silt, dry		
		0.0	Same		
		0.0	Same		
	Sample taken from 1-2' for laboratory analysis	0.0	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-34**

PROJECT: **Sunoco Philadelphia Refinery**
SITE LOCATION: **AOI-8**
JOB NO.: -
LOGGED BY: **Shaun Sykes**
DATES DRILLED: **5/6/08**

DRILLING CO.: **Parrat Wolff Inc.**
DRILLING METHOD **Direct Push**
SAMPLING METHOD **Split Spoon**
TOTAL DEPTH: **2'**

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, brick, sandy silt, dry		
		0.0	Same		
		0.0	Same		
	Sample taken from 1-2' for laboratory analysis	0.0	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-35**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**2'**
DATES DRILLED:	**5/6/08**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0		0.0	Fill - gravel, light brown silt & sand, dry		
		0.0	Fill - dark brown sandy silt, gravel, brick		
		0.0	Fill - gravel, light brown sandy silt		
	Sample taken from 1-2' for laboratory analysis	0.0	Same		Boring complete @ 2'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-36**

PROJECT: **Sunoco Philadelphia Refinery**
SITE LOCATION: **AOI-8**
JOB NO.: -
LOGGED BY: **Shaun Sykes**
DATES DRILLED: **6/19/2008**

DRILLING CO.: **Parrat Wolff Inc.**
DRILLING METHOD **Direct Push**
SAMPLING METHOD **Split Spoon**
TOTAL DEPTH: **8'**

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0			Fill, gravel, concrete		
		177	Black sandy silt, slightly moist		
		242	Black sandy clay and gravel, very moist to wet		
		218	Same		Water at 3-3.5'
	No sample taken (no tank bottom material observed)	81.8	Same, wet		
-5		101	Same, wet		
		212	Black sand and gravel, wet		
		243	Same		
					Boring complete @ 8'

SUBSURFACE BORING LOG

BOREHOLE NO. **BH-08-37**

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD	**Direct Push**
JOB NO.:	-	SAMPLING METHOD	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	TOTAL DEPTH:	**8'**
DATES DRILLED:	**6/19/2008**		

DEPTH (feet)	SAMPLE INTERVAL	PID (ppm)	LITHOLOGY DESCRIPTION	LITH-OLOGY	COMMENTS
0			Fill, gravel, concrete		
		136	Black sandy silt, slightly moist		
		252	Same		
	No sample taken (no tank bottom material observed)	341	Black sandy clay and gravel, wet		Water at 4-4.5'
-5		262	Same		
		115	Same		
		102	Same		
					Boring complete @ 8'

MONITORING WELL LOG: N-98

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/2/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**30'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.3		Fill - asphalt, black/brown sandy silt and gravel, dry			
	0.3					
	2.2			Sample taken 1-2' for laboratory analysis		
	0.6					
-5				Previously cleared to 10', backfilled with sand		
-10	0.0		Brown/tan fine sand, slightly moist		20' riser	
	0.0					
	0.0					
	0.0					
	0.3		Medium sand and gravel, slightly moist			
-15	0.2					
	0.0					
	0.0					
	1.1		Medium sand and gravel, moist			
	0.3					
-20	0.1		Medium to fine sand and gravel, trace tan clay, very moist to wet			
	0.0		Sand and gravel, trace clay, wet			
	0.0		Tan/brown sandy clay and gravel, trace clay, wet			
	0.0		Tan/brown sand and gravel, trace clay			
	0.0		Gray sand and clay, wet			
-25	0.0		Fine gray sand, trace clay, wet		10' screen	
	0.0					
	0.0		Brown/gray medium sand and gravel, wet			
	0.0					
	0.0			Auger/boring complete to 30'		
-30						

MONITORING WELL LOG: N-99

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/19/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**28'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - brown fine sand, dry			
	0.0					
	0.0			Sample taken 1-2' for laboratory analysis		
	0.0					
-5				Previously cleared to 10', backfilled with sand	18' riser	
-10	0.8		Coarse sand and gravel, trace gray clay			
	2.5					
	4.8		Same, no clay			
	1.2		Fine sand, slightly moist			
	0.9		Fine sand and gravel, slightly moist			
-15	0.3		Same, very moist			
	0.0		Coarse sand and gravel, very moist to wet			
	3.4					
	0.5					
	0.0					
-20	0.0		Gray fine sand, wet, trace clay		10' screen	
	0.0					
	0.0					
	0.0		Coarse tan/brown sand and gravel, wet			
	0.0					
-25	0.0					
	0.0					
	0.0		Fine sand, trace gray/orange clay	Auger complete to 28'		

SUBSURFACE LOG: N-100
AND WELL CONSTRUCTION : N-100

PROJECT:	**Sunoco-Philadelphia Refinery**	DRILLING CO.:	**Parratt-Wolffe**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**Hollow Stem Auger & Mud Rotary**
LOGGED BY:	**Tiffani Doerr/Shaun Sykes**	SAMPLING METHOD:	**Split Spoon**
DATES DRILLED:	**6/11-6/13/08**	SCREEN/RISER DIAMETER:	**2-inch**
TOTAL BORING DEPTH:	**63**	WELLBORE DIAMETER:	**8-inch**
BORING ELEVATION		TOC (inner) ELEVATION:	

NOTE: Well N-100 was drilled within 5 feet of boring N-100. Screen=0.010 slot; "0" sand; 2' stickup finish. Screen (10'-20'); Riser (2' stickup - 10'); Sand (8'-20'); Bentonite (4'-8'); Grout (surface to 4')

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
	8-4	0.0		Fill - dry mixture of brick, gravel, glass, brown sandy clay	Boring location pre-cleared by Mobile Dredge to 10'	
	7-4	0.0			Sample 1'-2' submitted for laboratory analysis	
-5						
-10	16-14			Tan clayey sand, large sandstone cobble in bottom		
	14-14					
	14-8	0.0		Tan medium sand, trace fine gravel, moist, wet at bottom		
	8-10	0.0				
	13-12	1.3		Bottom 4" mottled gray/lt.brown and yellow plastic sand w/ trace gravel Same as above to 15' (mottled plastic sand), Remainder gray gravelly med-coarse sand		
-15	10-10	3.1				

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SUBSURFACE LOG: N-100
AND WELL CONSTRUCTION: N-100

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
	5-8	9.6		Saturated at 17', same sand and gravel to 17'		
	12-9	2.4		17-17.5' Gray coarse sand 17.5-18' Mixed sand and gravel		
	9-8			Coarse gray sand with few fine gravels (coarser and more frequent gravels @ 19.5'). Fining upward sequence.		
	9-12			19.5'-20' thin fine sandy clay lense and 3" fine sand, last 3" same coarse sand w/ few small gravels		
-20	13-12	4.2		Tan/gray med-coarse sand w/ few gravels (fine to 1") sm. clay plug @ 21.5'	Switch from auger to mud rotary	
	12-14	3.6				
	13-14	13.6		Same as above		
	7-14	4.6		Yellow/gray mottled clay w/ some fine sand to 23.8',		
	9-6	20.3		Moist red-brown clay w/ some fine sand and few fine gravels Brown clayey fine sand w/ few round gravels to 25.5' (granite, red sandstone)		
-25	14-28	152				
	45-46	615		Dark gray coarse sand and gravel, strong petroleum odors Med-coarse dense gravel w/ sand matrix (red and gray sandstone, white qtz & qtzite). Heterogeneous, up to 2+" gravels.		
	50-50/0'					
	34-29	1286		Same, large gravel in sand matrix		
	29-34					
-30	13-30	356		6" Recovery - red/brown/gray sand and gravel (gray sand is gray qtz, fine sand is completely weathered sandstone; gravels are granite, qtzite, sandstone).		
	33-39					
	47-30	1020		Same, gravels w/ sand		
	30-24					
	49-35	660		Same as above - formation very tight (does not seem saturated)		
-35	17-12	21.7				

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SUBSURFACE LOG: N-100
AND WELL CONSTRUCTION: N-100

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
	20-22			Same as above		
	18-17					
	20-20	0.8		Same but smaller gravels and more sand now with few fines (clay and silt ~5%), saturated		
	25-25					
-40	20-25			No recovery (cobble in bottom - little recovery likely due to pushing larger gravels)		
	19-20					
	14-14	7.2		Brown med-coarse sand w/ few coarse gravels (extremely weathered gray & lt. gray fine sandstones) and few fine-med gravels (white and gray qtz and qtzite)		
	17-23	0.8				
	22-10	32.2		Lt. brown/gray coarse sand w/ few fine gravels, grades into orange-brown fine sand, last 2" gray clay w/ trace sand		
-45	12-6	1.1				
	12-13	46.8		Top 8" coarse gray sand w/ few gravels grade to orange fine sand, 4" lt. gray fat clay, 4" layers of gray/yellow and orange fine -med sand w/ coarse sand and fine gravel at bottom of spoon		
	13-18	0.8				
	10-14			No recovery - rock lodged in tip		
	20-32					
-50	12-11	0.1		Top 1' - laminated gray/orange silty clay and very fine sand, Bottom 1' - homogeneous coarse orange sand w/ trace fine gravel		
	17-18	0.1				
	10-14	5.8		Same as above to 53.5, orange brown clayey silt and fine sand w/ black laminations		
	18-25	0.3				
		0.5		Gray clayey silt and fine sand		
-55		0.5		Red/brown fine sand		
		1.9		Orange-brown fine sand, saturated		

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SUBSURFACE LOG: N-100
AND WELL CONSTRUCTION: N-100

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
		0.7		Same as above		
	15	4.3		Red/brown fine sand and clayey silt		
	22	0.9		Orange-brown fine sand and weathered rock		
-60	50	5.3		Orange-brown sand and weathered rock, micaceous	Borehole complete to 63'	
	22	7.3				
		15.3		6" recovery, mica SCHIST in spoon		
-65						
-70						

MONITORING WELL LOG: N-101

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/16/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**23'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0			Fill - gravel, brown silt and sand, dry			
			Fill - dark brown clayey silt, dry	Sample taken 1-2' for laboratory analysis		
-5				Previously cleared to 10', backfilled with sand	13' riser	
-10			Brown silty sand and gravel, dry			
			Brown silty coarse and and gravel, moist			
			Same, wet at 14'			
			Coarse sand and gravel, wet, sheen on spoon			
-15					10' screen	
-20			Gray fine sand, trace clay, very mosit			
				Auger complete to 23'		

MONITORING WELL LOG: N-102

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/5/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**30'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, silty sand, dry			
	1.2					
	2.6					
	10.3		Fill - brown/orange sandy clay, gravel	Sample taken 1-2' for laboratory analysis		
-5				Previously cleared to 10', backfilled with sand		
-10	869		Black fine sand, trace clay, very moist		20' riser	
	1112					
	1442		Black sand and gravel, very moist			
	1283					
	1515		Same, fine sand			
-15	1414					
	1312					
	1474					
	1374		Same, trace clay			
	1054		Tan/light brown fine sand and gravel			
-20	871		Black/gray fine sand and gravel, very moist			
	603		Same, wet			
	561		Black/gray coarse sand and gravel, wet			
	230		Same, brown clay at 24'			
	11.8		Brown sandy clay, compact, very moist			
-25	7.2		Gray/green fine sand and gravel, trace layers of clay		10' screen	
	11.7		Same, some clay layers			
	6.0		Brown/red fine sand, slightly moist			
	5.6					
	7.5			Auger/boring complete to 30'		
-30						

MONITORING WELL LOG: N-103

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/6/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**27'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill -gravel, silty sand, dry with some brick			
	0.0					
	0.2		Black/brown silty sand and gravel, dry	Sample taken 1-2' for laboratory analysis		
	10.6					
-5				Previously cleared to 10', backfilled with sand		
-10	6.6		Brown fine sand and some gravel, moist		17' riser	
	8.8					
	28.8					
	32.1		Coarse sand and gravel, moist			
	252					
-15	269					
	1120		Same, wet			
	1432		Same, wet			
	1226		Same, black, wet			
	1134		Same, black, wet			
-20	1652		Coarse sand and gravel, wet		10' screen	
	1466		Same, sheen on spoon			
	1720					
	321		Coarse sand and gravel, trace gray/brown clay, wet			
	9.2		Fine gray/brown sand, trace clay, moist			
-25	6.6					
	13.3		Orange/gray fine sand, trace clay, moist	Auger complete to 27'		
	5.2			Boring complete to 28'		

MONITORING WELL LOG: N-104

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/18/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**25'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, fine sand, dry			
	0.0					
	0.3		Fill - dark brown/black silty sand and gravel, dry	Sample taken 1-2' for laboratory analysis		
	6.1					
-5				Previously cleared to 10', backfilled with sand	15' riser	
-10			Sand from clearance			
			Sand from clearance			
	780		Brown fine sand, slightly moist			
	1303					
	860		Brown/black coarse sand and gravel, wet			
-15	927		Same, sheen on spoon			
	923		Black sand and gravel, wet			
	1206					
	525					
	969					
-20	16,1		Brown/orange fine sand, very moist		10' screen	
	7.4		Brown/orange fine sand, trace clay, moist			
	362		Brown/orange fine sand, moist			
	37.6					
-25				Auger complete to 25'		

MONITORING WELL LOG: N-105

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/18/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**25'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, fine sand, dry			
	0.0					
	0.2		Dark brown/black sandy silt and gravel, dry	Sample taken 1-2' for laboratory analysis		
	3.1					
-5				Previously cleared to 10', backfilled with sand	15' riser	
-10			Sand from clearance			
			Sand from clearance			
	478		Brown coarse sand and gravel, very moist			
	918					
	1109					
-15	738					
	341		Black coarse sand and gravel, wet			
	437		Same, sheen on spoon			
	1468		Same, wet			
	37.7		Brown/tan sand and gravel, wet			
-20	9.9		Brown/orange fine sand, trace clay, moist		10' screen	
	3.2		Brown/orange sand and clay, moist			
	106					
	5.9		Brown/orange fine sand, slightly moist			
-25				Auger complete to 25'		

MONITORING WELL LOG: N-106

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/5/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**19'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, silt			
	0.1		Concrete			
			Concrete, fill - brown silt and sand	Sample taken 1-2' for laboratory analysis		
-5				Previously cleared to 10', backfilled with sand	9' riser	
-10	763		Gray sandy clay and gravel, wet			
	1793		Coarse sand and gravel, trace black/gray clay, wet			
	2150					
	1768		Fine sand and gravel, black/gray, red sand 13.75-14'			
	1376		Coarse sand and gravel, trace clay, wet			
-15	261		Tan/orange clay and sand, slightly moist		10' screen	
	119					
	49.1		Orange/brown sand and clay, compact, slightly moist			
	163		Same, gravel	Auger complete to 19'		
	52.1		Fine light brown/orange sand, trace clay	Boring complete to 20'		
-20						

MONITORING WELL LOG: N-107

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/20/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**22'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.1		Fill - fine sand and gravel, dry			
	5.2		Fill - black/brown silty sand and gravel, dry			
	20.6			Sample taken 1-2' for laboratory analysis		
	28.3					
-5				Previously cleared to 10', backfilled with sand	12' riser	
-10			Medium sand, black, very moist			
	478		Coarse sand and gravel, black, wet			
	918					
	1109					
-15	738					
	341				10' screen	
	437		Fine sand and gravel, wet			
	1468					
	37.7		Tan/orange sandy clay, very moist			
-20	9.9		Tan fine sand, very moist			
	3.2			Auger complete to 22'		

MONITORING WELL LOG: N-108

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/29/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**18'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, sand, dry			
	0.5		Fill - brown/black silty sand, gravel, dry			
	123			Sample taken 1-2' for laboratory analysis		
	57.6					
					8' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	849		Coarse sand and gravel, gray/black, wet			
	1248					
	756		Medium to fine sand and gravel, wet		10' screen	
	842					
	756					
-15	121		Brown sandy clay and gravel, very moist			
	42.9		Brown/orange sandy clay and gravel, very moist, stiff			
	3.7			Auger/boring complete to 18'		

SUBSURFACE LOG: N-109
AND WELL CONSTRUCTION : N-109

PROJECT:	**Sunoco-Philadelphia Refinery**	DRILLING CO.:	**Parratt-Wolff**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**Hollow Stem Auger & Mud Rotary**
LOGGED BY:	**Tiffani Doerr/Shaun Sykes**	SAMPLING METHOD:	**Split Spoon**
DATES DRILLED:	**7/2-7/3/08**	SCREEN/RISER DIAMETER:	**2-inch**
TOTAL BORING DEPTH:	**42'6"**	WELLBORE DIAMETER:	**8-inch**
BORING ELEVATION		TOC (inner) ELEVATION:	

NOTE: Well N-109 was drilled within 5 feet of boring N-109. Screen=0.010 slot; "0" sand; 2' stickup finish. Screen (5'-20'); Riser (2' stickup - 5'); Sand (3'-20'); Bentonite (1'-3'); Grout (surface to 1')

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
0		0.0			Boring location pre-cleared by Mobile Dredge to 10'	
		0.0		FILL - dry, brown/black silty sand and gravel with brick.	Sample 1'-2' submitted for laboratory analysis	
-5						
-10	4-4	156		Moist to wet med brown silty fine sandy CLAY, gray mottling from 11-12', Fine-med gravel in bottom 2"		
	6-10	139				
	15-16	51.6		Wet med SAND w/ clay plugs to 13.5, last 6" fine-coarse sand w/ some fine to coarse gravels		
	32-50/0.4	18.5				
	18-20	252		Saturated med brown fine to med GRAVELS w/ coarse sand to 15'		

Aquaterra Technologies, Inc.

SUBSURFACE LOG: N-109
AND WELL CONSTRUCTION: N-109

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
-15	21-17	176		Med-coarse sand w/ gravel (fine-coarse 1")		
	20-32	58.4		Grades from lt. brown/gray fine to coarse sand from 16' to 16'10", then grades from coarse sand and fine gravel to heterogenous gravels, fine to 1" with coarse sand (gravels qtz, qtzite, sandstone)		
	27-27	322				
	50/0.2			Crushed gravel in tip, no return		
				Cobble/boulder from 18'2" to ~19'. Auger through to 20'.		
-20	4-7	0.0		Top 8" grading through orange/gray mix to mostly orange at bottom. 60-70% Mica, rest clay and fine sand. Saprolite - original rock structure present throughout. Overall, fine sandy clay.	Switch to mud rotary	
	8-9	0.0				
	6-6	0.0				
				Only 2" recovery - same as above.		
	9-8					
	5-16	0.0		Same to 25'		
-25	15-11	0.0		25-25'10" - Larger mica flakes and qtz. grains, few qtz-mica gravels, last 2" white clay w/ gray fine qtz. gravels		
	24-25	0.0		12" Recovery - top 2" same as above, 90% mica (up to 0.5" books) w/few fine sands and white clay (not layered)		
	27-35					
	24-28	1.6		Same to 29'		
	29-29	0.0		Layered/laminated white/gray coarse mica w/ clay and orange/black mica w/ clay		
-30	11-9	0.0		Top 1' - light gray fine - med micaceous clayey sand, next 6" same as above but coarse, last 6" layered alternating lt. gray/orange brown mica w/ little clay		
	11-19	0.0				
	32-24	0.0		Same as above, heavy mica saprolite, gray and clayey to 33'		
	37-47	0.0		1" layer of round med-coarse gray qtzite gravel @ 33', last 1' laminated orange white/gray clay		
	15-12	0.0		Yellow-gray medium grained qtz-mica sand, 2" white clay w/ very fine qtz gravels		

SUBSURFACE LOG: N-109
AND WELL CONSTRUCTION: N-109

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
-35	13-15	0.0				
	16-19			No recovery		
	26-32					
	18-19	0.0		Slight layering orange-yellow gray muscovite-biotite and fine qtz sand. Some yellow-white clay layers w/ coarse qtz gravels		
	47-50/0.4	0.0				
-40	34-45	5.3		Same as above		
	50/0.3	1.0				
	78/6"	8.2		Extremely weathered bedrock	Borehole complete to 42'6"	

MONITORING WELL LOG: N-110

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/14/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**15'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, tan sandy silt, dry			
	0.1					
	0.3					
	0.3		Brown sandy silt and gravel, dry	Sample taken 1-2' for laboratory analysis		
					5' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	27.3		Brown/black sand with clay, wet		10' screen	
	28.9					
	52.2		Black/brown coarse sand, gravel, wet			
	98.9					
	97.6		Black/brown coarse sand and gravel, wet	Auger to 15'		
-15	89.2					
	78.5					
	22.9		Black/brown clay, very moist	Boring complete to 18'		

MONITORING WELL LOG: N-111

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/14/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**15'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - brown sandy silt, dry			
	1.3		Same with gravel			
	1.7		Fill - brown/black silty sand and gravel, dry, some brick	Sample taken 1-2' for laboratory analysis		
	1.2				5' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	84.6		Black/gray sand and gravel, wet, some brick		10' screen	
	92.1					
	112					
	59.9		Black sandy clay with gravel, wet			
	149		Black coarse sand and gravel, wet	Auger to 15'		
-15	46.3		Black clay, very moist to wet			
	56.8		Black sandy clay, very moist to wet			
	38.5			Boring complete to 18'		

MONITORING WELL LOG: N-112

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/14/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**20'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, brown sandy silt, dry			
	2.8					
	6.4		Fill - brown/black silty sand and gravel, dry	Sample taken 1-2' for laboratory analysis		
	8.5					
					5' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	89,7		Dark brown clayey sand and gravel, wet		15' screen	
	143					
	178					
	128		Brown/tan sand and gravel, wet			
	193		Brown sand and coarse gravel, wet	Visible sheen on spoon at 14'		
-15	223					
	145					
	194					
	9.8		Sand and gravel, very moist			
	8.7		Sand and gravel, greenish tint, trace clay, very moist	Auger complete to 20'		
-20						

MONITORING WELL LOG: N-113

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/15/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**15'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - tar, brown sandy clay and gravel			
	0.9		Fill - brown/gray silty clay and gravel			
	7.5			Sample taken 1-2' for laboratory analysis	5'	
	6.6					
-5				Previously cleared to 10', backfilled with sand		
-10	106		Brown sand w/ clay, wet		10' screen	
	95.6					
	260					
	25.8					
	5.8		Brown/tan stiff sandy clay, very moist	Auger complete to 15'		
-15						

MONITORING WELL LOG: N-114

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/13/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**25'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	45.4		Fill - gravel, brown sandy silt, dry			
	288					
	302		Fill - brown/black sandy silt and gravel, wood fragments	Sample taken 1-2' for laboratory analysis		
	292					
-5				Previously cleared to 10', backfilled with sand	10' riser	
-10	349		Coarse sand and gravel, very moist			
	562		Brown sandy clay and gravel, very moist			
	342		Brown sand and gravel, trace clay, very moist			
	284					
	181		Sand and coarse gravel, trace brown clay, very moist			
-15	240					
	249		Sand and gravel turning to coarse gravel, very moist			
	7.3		Sand and coarse gravel, trace orange/brown sandy silt			
	293		Sand and coarse gravel, moist			
	12.4		Tan clay and micaceous sand			
-20	69.6				15' screen	
	13.2					
	8.0		Same, trace brown/gray clay			
	1.8					
	1.5		Micaceous sand	Auger complete to 25'		
-25						

MONITORING WELL LOG: N-115

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Continuous Split Spoon**
LOGGED BY:	**T. Doerr**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/28/08**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**14'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0						
	1.2		FILL material - dry dark brown to black brick, sandy clay material (few layers), cinders	Sample taken 1-2' for laboratory analysis	~2' stick up	
	4.6				0'-4' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	80.5		Gray/black coarse SAND and GRAVEL, petroleum soaked		4'-14' screen	
	3.6		Light brown sl plastic very fine sandy SILT, slightly micaceous, moist			
	72.2		Gray/black coarse SAND and GRAVEL to 13'4"			
	0.9		Slightly mottled light brown and gray CLAY with some silt	Auger complete to 14'		
	2.3		14'-14'4" CLAY			
			Gray fine SAND	Saturated at 15'		
-15	1.0		Gray clayey SAND	Boring complete to 16'		
			Bottom 1" gray/orange mottled CLAY			

MONITORING WELL LOG: N-116

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/20/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**12'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	4.9		Fill - gravel, sand, tan/brown silty sand, dry			
	16.8		Fill - brown/black sand and gravel, dry			
	182			Sample taken 1-2' for laboratory analysis		
	147		Gray sandy clay, moist, stiff		2' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	98.8		Black/gray sandy clay, very moist, sheen		10' screen	
	85.6			Auger complete to 12'		
	46.5					
	87.5			Boring complete to 14'		

MONITORING WELL LOG: N-117

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Continuous Split Spoon**
LOGGED BY:	**T. Doerr**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/4/08**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**20'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	1.3		FILL - gravel w/ sand to 1.5'		~2' stick up	
	2.4		Brown moist clayey sand and gravel	Sample taken 1-2' for laboratory analysis		
-5				Previously cleared to 10', backfilled with sand	0'-8' riser	
-10	94.8		Very moist dark brown sandy CLAY mottled with black product to 13'	Product present from 10' to 16'	8'-20' screen	
	66.9					
	251					
	743		Wet brown to black product laden GRAVEL (sub-angular up to 1.5") with coarse sand			
	480					
-15	732					
	855		Saturated (water) at 16'			
	282		Medium brown to red-brown fine SAND			
	56.4		Micaceous fine to medium SAND	Auger/boring complete to 20'		
	30.2		Orange and gray mottled very fine sandy SILT grading to clayey silt (19.5'-20')			
-20						

MONITORING WELL LOG: N-118

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/23/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**20'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.1		Fill - brown silty sand and gravel, moist			
	3.6		Fill - black/brown sitly sand and gravel			
	142			Sample taken 1-2' for laboratory analysis		
	156					
-5				Previously cleared to 10', backfilled with sand	10' riser	
-10	86.6		Coarse sand and gravel, wet			
	225					
	971		Same, trace brown clay			
	1633		Same, trace brown clay			
	966					
-15	781		Coarse sand and gravel. trace clay		10' screen	
	93.5		Red/brown sandy clay and gravel			
	13.7		Tan/orange sandy clay			
	14.7		Tan/orange sand, some clay			
	22.1			Auger/boring complete to 20'		
-20						

MONITORING WELL LOG: N-119

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/29/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**18'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	5.9		Fill - gravel, sand, dry			
	6.2		Fill - orange/brown sandy silt and gravel, dry			
	7.4					
	14.1		Brown/black silt and clay, dry	Sample taken 1-2' for laboratory analysis		
					8' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	1341		Black coarse sand and gravel, wet			
	1678					
	186		Black/gray medium sand and gravel, trace clay, wet		10' screen	
	35.5					
	28.7					
-15	14.3					
	26.6		Coarse sand and gravel, wet			
	7.5			Auger complete to 18'		

MONITORING WELL LOG: N-120

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/22/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**18'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - medium brown sandy clay and gravel, dry			
	0.0					
	0.0			Sample taken 1-2' for laboratory analysis		
	0.4					
-5				Previously cleared to 10', backfilled with sand	8' riser	
-10	994		Black coarse sand and gravel, wet, sheen			
	1063					
	1074				10' screen	
	983					
	35.7		Tan/orange sandy clay, very moist			
-15	29.3					
	43.4		Gray sand and clay, some gravel, very moist			
	28.6			Auger/boring complete to 18'		

MONITORING WELL LOG: N-121

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/9/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**20'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, brown silty and sand, dry			
	5.3					
	34.6		Dark brown fill, gravel, sandy clay	Sample taken 1-2' for laboratory analysis		
	40.8					
-5				Previously cleared to 10', backfilled with sand	10' riser	
-10	1446		Fine sand and gravel, brown, wet			
	1332		Coarse sand and gravel, wet			
	1177					
	36.1		Gray/orange fine sand and clay, very moist			
	72.6		Gray fine sand, trace clay, very moist			
-15	39.6				10' screen	
	535		Coarse sand and gravel, very moist to wet			
	80.1		Gray/orange fine sand, very moist			
	45.5		Tan/orange fine sand, trace clay, very moist			
	26.6		Same, increased clay content	Auger/boring complete to 20'		
-20						

MONITORING WELL LOG: N-122

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/21/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**18'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, stiff brown silty, dry			
	18.8					
	78.9		Fill - gray/black stiff sandy silt, gravel, dry	Sample taken 1-2' for laboratory analysis		
	15.7					
					6' riser	
-5				Previously cleared to 10', backfilled with sand		
				Water at 8'		
-10	6.6		Dark brown/gray sand and clay, some gravel, very moist to wet			
	7.2		Same, increased clay content			
	5.3		Brown/gray sand with clay, very moist		12' screen	
	3.9		Gray sand with clay, very moist			
	1.3					
-15	1.1		Orange-tan/gray sandy clay, very moist			
	4.3		Same, some gravel			
	2.2		Gray/brown sand and clay, moist	Auger/boring complete to 18'		

MONITORING WELL LOG: N-123

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/20/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**20'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, sand, brick			
	0.5					
	0.8			Sample taken 1-2' for laboratory analysis		
	1.2		Same, trace silt and clay			
-5				Previously cleared to 10', backfilled with sand	10' riser	
-10	24.5		Coarse sand and gravel, black, sheen, very moist			
	37.6					
	116		Same, wet			
	254					
	236		Same, very moist to wet			
-15	117				10' screen	
	65.2		Same, trace clay			
	20.3					
	6.5		Coarse sand and gravel, trace clay			
	7.9			Auger/boring complete to 20'		
-20						

MONITORING WELL LOG: N-124

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/21/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**25'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - sand, gravel, brick, dry			
	0.0					
	0.4			Sample taken 1-2' for laboratory analysis		
	0.5					
-5				Previously cleared to 10', backfilled with sand	10' riser	
-10	0.0		Fill - sand, gravel, brick, trace brown clay			
	0.0					
	0.2		Black coarse sand and gravel, very moist			
	0.4					
	0.0		Brown/gray sandy clay and gravel, very moist to wet			
-15	0.0				15' screen	
	0.0		Orange/brown sandy clay and gravel, very moist to wet			
	0.0					
	0.0		Same, wet			
	0.0					
-20	0.0		Light brown sand and clay, some gravel, wet			
	0.0					
	0.0		Same, very moist			
	0.0					
	0.0			Auger complete to 25'		
-25						

MONITORING WELL LOG: N-125

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**6/17/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**25'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, sand, brick, concrete, dry			
	4.2					
	3.7			Sample taken 1-2' for laboratory analysis		
	35.2					
-5				Previously cleared to 10', backfilled with sand	15' riser	
-10	392		Clayey sand and gravel, dry			
	894					
	1065		Brown/tan coarse sand and gravel, moist			
	1225					
	770		Brown fine sand, very moist to wet			
-15	756					
	467		Brown fine sand, very moist (6" recovery)			
	401					
	302					
-20	483		Same, wet		10' screen	
	92		Coarse sand and gravel, wet			
	96.2					
	10.2		Gray fine clayey sand, very moist			
-25				Auger complete to 25'		

MONITORING WELL LOG: N-126

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/29/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**14'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.8		Fill - brown sandy silt, gravel, brick, dry			
	1.2					
	120		Fill - brown/black sandy silt, gravel, dry, trace clay	Sample taken 1-2' for laboratory analysis		
	456				4' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	348		Fill - black gravel, wood, wet		10' screen	
	57.4		Black coarse sand and gravel, wet			
	409					
	20.0		Black/brown sandy clay, very moist	Auger/boring complete to 14'		

SUBSURFACE LOG: N-129
AND WELL CONSTRUCTION : N-129

PROJECT:	**Sunoco-Philadelphia Refinery**	DRILLING CO.:	**Parratt-Wolff**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**Hollow Stem Auger & Mud Rotary**
LOGGED BY:	**Tiffani Doerr/Shaun Sykes**	SAMPLING METHOD:	**Split Spoon**
DATES DRILLED:	**6/24-6/26/08 & 7/1/08**	SCREEN/RISER DIAMETER:	**2-inch**
TOTAL BORING DEPTH:	**103**	WELLBORE DIAMETER:	**8-inch**
BORING ELEVATION		TOC (inner) ELEVATION:	

NOTE: Well N-129 was drilled within 5 feet of boring N-129. Screen=0.010 slot; "0" sand; 2' stickup finish. Screen (14'-30'); Riser (2' stickup - 14'); Sand (12'-30'); Bentonite (10'-12'); Grout (surface to 10')

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
0				FILL - brown sandy silt and gravel, dry.	Boring location pre-cleared by Mobile Dredge to 10' Sample 1'-2' submitted for laboratory analysis	
-5						
-10	1-7			No recovery		
	13-16					
	12-9	0.0		Moist coarse SAND and fine GRAVEL, light brown		
	12-12	0.1				
	19-22	187		Wet, brown, heterogeneous mix of fine sand to coarse gravel (gravels vary in color and comp: sandstone, quartzite: brn, blk, wht). Strong odors.	Boring augered to 14', then switched to mud rotary drilling.	
-15	15-11					
	12-5	869		Wet, brown medium SAND (no gravel) w/1" plug of fine sandy clay at 17'10".		

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SUBSURFACE LOG: N-129
AND WELL CONSTRUCTION: N-129

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
	7-8			Sand saturated w/ product at 18'.		
	11-15	371				
	17-14					
-20	18-15			Medium SAND with GRAVELS (brn, blk, red), not prod saturated. No recovery		
	13-16					
	16-12	114		Brown, medium coarse SAND w/ few fine gravels. Prod saturated		
	14-15					
	5-9	102		Prod. saturated coarse sand & fine gravel to 26.5'. Only few vugs of product at 26.5'.		
-25	11-9					
	10-19	11.7		Yellow and gray fine sandy CLAY	At 26' stong odors, but not petroleum. Pungent, fruity (like additive or solvent).	
	16-25	13.3		Slightly micaceous, moist tan and gray fine to med. SAND		
	17-21	14.6				
	18-8					
-30	3-1	9.9		Moist layered orange/gray SILTY CLAY w/ very fine SAND, color change to dark gray 31.5'		
	3-4	18.4				
	17-21	13.8		Same as 31.5'-32', moist dark gray micaceious sl. plastic very fine SANDY SILT		
	19-15	28.8				
	4-4	6.2				
-35	5-10	5.0				
	6-9	1.6		Few sandier layers at 36'.		
	9-10	1.7				
	8-9	0.9				
	8-9	0.7				

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SUBSURFACE LOG: N-129
AND WELL CONSTRUCTION: N-129

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
-40	5-5	0.3		Silty CLAY w/ trace fine sand to 41'10"		
	5-9	0.3				
	9-7	0.2		Sat. brown medium SAND, trace fine gravel. At 43', brown slightly plastic silty very fine micaceous sand		
	9-9	0.2				
	2-2	0.4		Brown slightly micaceous very fine sandy CLAY		
-45	2-3	0.3				
	2-4	0.5		1" layers of fine sand at 46.5' and 47.5'		
	5-5	0.4				
	4-5			No recovery		
	6-8					
-50	12-13	0.0		Alternating layers of brown clayey fine SAND and med sand (1-3" layers)		
	15-9	0.0				
	11-9	0.4		Brown medium sand w/ few coarse grains		
	18-19	0.2		Alternating layers of brown fine clayey sand and brown medium sand with coarse grains		
	10-4	0.0		Same alternating layers to 57.5'; sand layers only 1" thick and all fine sands, Fine sandy clay layers 6" thick.		
-55	6-5	0.0				
	12-16	3.3				
	18-13	2.2		Medium-coarse sand w/ trace fine gravels, saturated, slight odors		
	12-18	9.1		Same as last 1', Sandy clay plug at 59.5', orange-brown in color near bottom		
	19-24	3.1				
-60	18-16	12.3		18" Recovery - Top 6" - 3" Brown fine sandy clay, 3" - Brown fine sand, Lower 1' - yellow brown coarse sand with few fine gravels		
	13-15	3.6				
	34-24	18.7		12" Recovery - Top 6" - Lt. brown medium sands, Lower 6" - Coarse sand and fine gravel with medium gravel in bottom 1"		

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SUBSURFACE LOG: N-129
AND WELL CONSTRUCTION: N-129

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
	24-17					
	23-17	2.5		12" Recovery - Red-brown and gray heterogeneous gravel and coarse sand with trace clay		
-65	13-15					
	18-17	13.7		Medium gray/brown med-coarse sand and fine gravel at top grades to coarse sand and fine-med gravel at 67'		
	19-27	2.0		Mix of coarse sand with fine gravel		
	27-50/0.4	57.2		Brown med-coarse gravels w/ sand		
		35.4				
-70	38-40	9.3		Brown med-coarse gravels w/ sand		
	50/0.3					
	50/0.6			Same		
	48-25	4.6		Same		
-75	50/0.4					
	45-38	3.6		14" Recovery, gravel and sand to 77.5', 2" layer gray fine sand w/ clay, 3" gray coarse sand w/ few fine gravels, 1" gray fine sand		
	19-26					
		4.0		6" gray fine sand, 1' Orange/yellow coarse sand and gravel, 6" compact dark gray clay, trace sand		
		3.2				
-80	8-9	0.0		10" recovery, compact dark gray clay, trace fine sand		
	14-20	0.0				
	15-14	1.0		6" recovery, top 2" compact dark gray clay, trace sand, bottom 4" gray/brown med. sand and gravel		
	18-17	0.3				
	7-8	0.0		Compact dark gray clay, trace fine sand		
-85	9-9	0.0				

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SUBSURFACE LOG: N-129
AND WELL CONSTRUCTION: N-129

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
	7-6	0.0		Same, increase in sand content bottom 4"		
	7-12	0.0				
	11-12	0.0		6" recovery, same		
	7-12	0.0				
-90	12-13	0.0		Compact dark gray clay w/ trace fine sand layers		
	5-7	0.0				
	7-12	0.0		Compact dark gray clay w/ numerous thin fine sand layers		
	7-13	0.0				
	18-18					
-95						
	11-10	0.6		Moist, stiff dark gray silty clay, few thin layers of fine sand		
	14-20	0.1				
-100	17-19	3.6		Moist, fine to medium gray micaceous sand w/ few fine gravels, clayey sand plugs present	Borehole complete to 103'	
	17-10	0.8				
	76-105	1.6		Moist, fine to med. gray micaceous sand to 102'10", bottom 2" - gray qtz. gravels w/ black/white SCHIST in bottom of spoon		

MONITORING WELL LOG: N-130

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Continuous Split Spoon**
LOGGED BY:	**T. Doerr**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/16/08**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**32'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0					
	0.0		Med brown moist plastic fine sandy SILT, no gravel		~2' stick up	
	0.1			Sample taken 1-2' for laboratory analysis		
	0.2					
-5				Previously cleared to 10', backfilled with sand	0'-18' riser	
-10	0.4		Moist, light brown SAND and GRAVEL. White/yellow coarse sand with 50% round to subround gravel from 1/8" to 1.5" (quartz, sandstone and brn siltstone gravels). Extends to 19.5'			
	0.3					
	0.1					
	0.1					
	0.3					

MONITORING WELL LOG: N-130

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
-15	0.3					
	0.4					
	0.4					
	45.5		Slightly more orange at 19'			
	120		Dark gray coarse SAND with fine GRAVEL with fewer and smaller gravel extends from 19.5' to 25'. Heavy petroleum odors start at 19.5'			
-20	293		2" layer medium SAND at 20'			
	398			Saturated at 21' (sheen)		
	547		2" layer medium SAND at 21'10"			
	421					
	393					
-25	126		From 25' to 26' grades to medium-fine SAND with sandstone cobble in bottom of spoon		18'-30' screen	
	13.7		Brown coarse SAND and fine GRAVELS (yellow & white quartz) from 26' to 26.5'			
	6.7		26.5'-28' - Alternating 3" layers of gray med-coarse sand and gray sand and gravels (<1") of qtz and brn-red siltstone			
	22		Gray med-coarse sand with few gravels to 32'			
	2.9			Auger complete to 30'		
-30	99.7			Boring complete to 32'		
	4.1					

SUBSURFACE LOG: N-131
AND WELL CONSTRUCTION : N-131

PROJECT:	**Sunoco-Philadelphia Refinery**	DRILLING CO.:	**Parratt-Wolffe**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**Hollow Stem Auger & Mud Rotary**
LOGGED BY:	**Tiffani Doerr**	SAMPLING METHOD:	**Split Spoon**
DATES DRILLED:	**6/3/08 & 6/10/08**	SCREEN/RISER DIAMETER:	**2-inch**
TOTAL BORING DEPTH:	**70**	WELLBORE DIAMETER:	**8-inch**
BORING ELEVATION		TOC (inner) ELEVATION:	

NOTE: Well N-131 was drilled within 5 feet of boring N-131 on 6/17/2008. Screen=0.010 slot; "0" sand; 2' stickup finish. Screen (5'-15'); Riser (2' stickup - 5'); Sand (3'-15'); Bentonite (1'-3'); Grout (surface to 1')

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
0		0.1				
		15.5			Boring location pre-cleared by Mobile Dredge to 10'	
		46.5				
		52.2		Brown-black silty sand and gravel. Asphalt layer at 3.5 feet.	Sample 1'-2' submitted for laboratory analysis	
-5						
-10	3-6	241		Wet, black, medium SAND and GRAVEL.		
	1/1'	207				
	2-1	128		Dark brown micaceous silty CLAY, with wood and organic matter.		
	2-1	70.1				
	1-2	3.2				

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SUBSURFACE LOG: N-131
AND WELL CONSTRUCTION: N-131

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
-15	3-1	1.9				
	1-2	0.6				
	2-1	0.8				
	1-1	0.9				
	1-1					
-20	1-2	0.0		Same, but becomes gray at 20'.	Augers pulled at 20'. Switch to mud rotary for remainder of drilling.	
	3-6	0.0				
	2-1	0.0				
	1-1	0.0				
	woh/2'	0.0				
-25	woh/2'	0.0				
	woh/1'	0.1		Becomes silty at 26'. Less organic matter.		
	4-2	0.0				
	woh/1'	0.0				
	3-2	0.0				
-30	woh/2'	0.0		Dark gray CLAY with trace fine sand and organics.		
	woh/2'	0.0				
	woh/2'	0.0				
	woh/2'	0.0				
	woh/3'	0.0				

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SUBSURFACE LOG: N-131
AND WELL CONSTRUCTION: N-131

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
-35	woh/3'	0.0				
	2-2	0.0				
	2-2	0.0		36.5' to 37' - Fine clayey sand layer.		
	3-2	0.0		Fine brown/gray slightly micaceous SAND with layers of clay.		
	3-2	0.0				
-40	woh/2'	0.0				
	woh/2'	0.0		Dark gray CLAY with few fine sands and organics. Some silt.		
	3-2	0.0				
	3-2	0.0				
	3-3	0.0		Dark gray silty CLAY wtih 1" spaced fine sand laminations. Some woody layers.		
-45	3-3	0.0				
	5-6	0.0				
	5-6	0.0				
	4-5	0.0		Brown/gray fine SAND, trace clay and organic matter.		
	4-5	0.0				
-50	4-6	0.0				
	4-6	0.6				
	7-9	0.3		Sand grains increasing in size.		
	7-9	1.0		Brown/gray coarse SAND, slight odor, saturated.		
	2-4	0.0		Moist, gray plastic micaceous SILT to SILTY CLAY to 55.5'. 2" layer of coarse sand at 54.5'.		

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SUBSURFACE LOG: N-131
AND WELL CONSTRUCTION: N-131

Depth (feet)	Blow Counts	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL DIAGRAM
-55	2-8	0.2				
	3-5	0.3		Gray/brown medium coarse SAND (mostly qtz with mica flakes) with trace fine gravels to 60.5'. 2" clay/silt lenses at 56.5' and 57.5'. Very weathered petroleum odors. Saturated.		
	6-11	1.2				
	5-6	0.3				
	0-2	0.4				
-60	2-2	0.0				
				60.5' to 61' soft clay and sand layer		
	2-2	0.1		Gray clayey SILT/silty CLAY with very fine sand laminations at 1 cm intervals.		
	2-2	0.5		Very loose/soft, wet clay/sand mixture to 63'4". 63'4" clayey silt with very fine sand (few irregular laminations). Layer of fine gravel near 64'.		
	2-2	0.2				
	7-8	0.0		Finely laminated clayey SILTS and very fine SANDS. 1" wood layer at 64.5'. 1" coarse-grained weathered qtz-mica rock at 65.5'.		
-65	2-2	0.2				
	4-4	1.2		Coarse SAND and fine GRAVEL. Homogeneous with exception of band of larger gravel (~1") at 66.5'. Gravel is variable in color and composition: white, yellow, green, brown, orange, black - qtz, sandstone, qtzite, biotite. Few fines give overall gray appearance.		
	4-8	0.2				
	8-8	0.1		6" plastic sitly very fine SAND. Gray and red-brown fine to medium SAND grading to coarse sand at 69'4" and into GRAVEL at 69'8".		
	4-50	0.7		3" of silty CLAY with few gravels. Bottom 1" of last spoon is fine grained black/white qtz-mica SCHIST.	Augered to 70', attempted another spoon 50/0" - schist in tip of spoon.	
-70						

MONITORING WELL LOG: N-132

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/13/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**25'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.2		Fill - gravel, brown/black sandy silt, dry			
	1.2					
	2.3		Fill - gravel, brown/black silty sand, brick, dry	Sample taken 1-2' for laboratory analysis		
	3.2					
-5				Previously cleared to 10', backfilled with sand	15' riser	
-10	8.7		Brown/black silty sand, gravel, wet			
	13.5		Brown/black silty clay, very moist to wet			
	23.4					
	30.6		Brown/black silty sand, very moist to wet			
	29.9		Brown/black sandy clay, very moist			
-15	30.4					
	30.2		Brown/black silty sand, moist			
	2.0		Brown/black clay with organic matter, moist			
	0.9		Brown/black sandy clay, moist			
	0.8		Dark brown clay, trace sand			
-20	1.2		Dark brown clay, trace sand, organic matter, moist		10' screen	
	0.9					
	3.2		Brown/black sand, trace clay, wet			
	1.4		Same, increased clay content			
	0.9		Brown/black sand and clay, wet	Auger complete to 25'		
-25						

MONITORING WELL LOG: N-133

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/15/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**12'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.1		Fill - gravel, tan silty sand, dry			
	2.9		Fill - brown/black silty sand, gravel, brick, dry			
	6.7		Fill - brown/black silty sand, gravel, wood, dry			
	11.9		Same, wet at 2'	Sample taken 1-2' for laboratory analysis	2' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	215		Black sand and gravel, wet		10' screen	
	185			Auger complete to 12'		

MONITORING WELL LOG: N-134

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/22/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**20'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - dark brown silty sand, gravel, brick			
	0.0					
	0.0					
	0.0			Sample taken 1-2' for laboratory analysis		
-5				Previously cleared to 10', backfilled with sand	10' riser	
-10	0.0		Tan/orange sandy clay and gravel, very moist to wet			
	0.0					
	0.0		Reb/brown/orange sand and gravel, trace clay, very moist to wet			
	0.0					
	0.0					
-15	0.0				10' screen	
	0.0		Brown/red/orange sand and gravel, trace clay			
	8.0					
	58.4		Gray/red sand and gravel, trace clay			
	62.2			Auger/boring complete to 20'		
-20						

MONITORING WELL LOG: N-135

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/15/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**12'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - black/brown silty sand and gravel, dry			
	0.7					
	1.2		Black sand and gravel, very moist	Sample taken 1-2' for laboratory analysis		
	2.3		Same, wet at 2'		2' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	57.1		Fill - gravel, wood, brick		10' screen	
	69.3			Auger complete to 12'		
	115					
	121		Black sandy clay, wet	Boring complete to 14'		

MONITORING WELL LOG: N-136

PROJECT:	**Sunoco Philadelphia Refinery**	DRILLING CO.:	**Parrat Wolff Inc.**
SITE LOCATION:	**AOI-8**	DRILLING METHOD:	**6" Hollow Stem Auger**
JOB NO.:		SAMPLING METHOD:	**Split Spoon**
LOGGED BY:	**Shaun Sykes**	SCREEN/RISER DIAMETER:	**2"**
DATES DRILLED:	**5/15/2008**	WELLBORE DIAMETER:	**6"**
TOTAL DEPTH:	**12'**	ELEVATION:	

Depth (feet)	OVM (ppm)	USCS	LITHOLOGY	COMMENTS	WELL CONSTRUCTION	WELL DIAGRAM
0	0.0		Fill - gravel, brown sandy silt, slightly moist			
	0.5					
	0.6			Sample taken 1-2' for laboratory analysis		
	1.2		Brown/black silty sand and gravel, very moist		2' riser	
-5				Previously cleared to 10', backfilled with sand		
-10	75.6		Black/gray sand and gravel, trace clay, wet		10' screen	
	124		Black/gray sandy clay, wet	Auger complete to 12'		
	89.2		Black/gray sandy clay, very moist			
	75.6			Boring complete to 15'		
	64.2					
-15						